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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/717,089

11/19/2003

David G. Converse

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7010

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05/10/2005

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210 Main Street
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EXAMINER

CANTELMO, GREGG

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 05/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/717,089

Applicant(s)

CONVERSE ET AL.

Examiner

Gregg Cantelmo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) 7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. In response to the arguments filed March 21, 2005:
 - a. The restriction stands;
 - b. The prior art rejection is withdrawn.

Election/Restrictions

2. Applicant's election with traverse of the restriction in the reply filed on March 21, 2005 is acknowledged. The traversal is on the ground(s) that the claims are Markush claims and since there are only 2 claimed inventions that the. This is not found persuasive.

Applicant's response does not appreciate the full scope of which the MPEP addresses restriction of Markush claims.

If the members of the Markush group are sufficiently few in number or so closely related that a search and examination of the entire claim can be made without serious burden, the examiner must examine all the members of the Markush group in the claim on the merits, even though they are directed to independent and distinct inventions (MPEP § 803.02). The underscored portion above was omitted from Applicant's response in arguing the restriction and thus is not held to be a full and complete interpretation of this section of the MPEP.

It is held that each species in the Markush grouping is drawn to significant differences as set forth in the previous restriction and thus considered to be a serious burden. Applicant provides no clear reasoning or statement to the contrary with respect

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to the specifics of the species defined by the Examiner as presented in the previous restriction. Thus there are insufficient grounds for withdrawal of the restriction.

If the Markush-type claim is not allowable over the prior art (as is the case in the instant application), examination will be limited to the Markush-type claim and claims to the elected species, with claims drawn to species patentably distinct from the elected species held withdrawn from further consideration.

Furthermore each species in the Markush group is disclosed as being separate from one another and there is no disclosure of relationship between each species. Where there is no disclosure of relationship between species (see MPEP § 806.04(b)), they are independent inventions and election of one invention following a requirement for restriction is mandatory even though applicant disagrees with the examiner. There must be a patentable difference between the species as claimed. See MPEP § 806.04(h). Since the claims are directed to independent inventions, restriction is proper pursuant to 35 U.S.C. 121, and it is not necessary to show a separate status in the art or separate classification.

Note that Applicants citation from MPEP § 802.02 is not accurate. A review of the current MPEP § 802.02 states the following:

“Restriction, a generic term, includes the practice of requiring an election between distinct inventions, for example, election between combination and subcombination inventions, and the practice relating to an election between independent inventions, for example, and election of species.” If Applicant has mistakenly identified the wrong section, clarity is respectfully requested.

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The requirement is still deemed proper and is made FINAL.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-3 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the electric energy storage device always following the voltage between the output power lines and is substantially the same as the voltage between the power lines, does not reasonably provide enablement for the fuel cell always following the voltage. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims. It is unclear whether the term "fuel cell stack" in line 10 of the claim should be "electric energy storage device". A review of the specification would appear to suggest that the claim may be inconsistent with the disclosure of the specification which states that the storage device follows the voltage output of the fuel cell stack (see page 4, ll. 16-20). Clarity is respectfully request

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

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only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 4 is rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application Publication No. 2004/0018399 (Jung).

Jung discloses a fuel cell power plan in Fig. 2 comprising a fuel cell stack 103 having electric power output lines, an electric storage element 101 associated with the stack, DC/DC converter 111 which is a means for providing a voltage to element 101 which is a fraction or multiple of the voltage between the output power lines. Controller 119 is a means for controlling the voltage provided to element 101 (Figs. 1 and 2 as applied to claim 4).

While intended use recitations and other types of functional language cannot be entirely disregarded. However, in apparatus, article, and composition claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. In re Casey, 370 F.2d 576, 152 USPQ 235 (CCPA 1967); In re Otto, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963).

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). See also MPEP § 2114.

The manner of operating the device does not differentiate an apparatus claim from the prior art. A claim containing a "recitation with respect to the manner in which a

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claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987)

Response to Arguments

5. Applicant's arguments with respect to claim 4 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2004/0018399 (Jung) in view of U.S. patent No. 6,864,003 (Udea).

Jung discloses a fuel cell power plan in Fig. 2 comprising a fuel cell stack 103 having electric power output lines, a source of fuel connected to the stack (not shown but inherent for the fuel cell reactants to be supplied to the fuel cell in order for the fuel cell to effectively operate). The system is in connection to controller 119 to control the various components of the system. The output lines are connected to a DC/DC converter 111 and battery 101. The converter 111 and battery 101 are in series

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between the output lines between the fuel cell 103 and load 115/117 (Figs. 1 and 2 as applied to claim 1).

The storage devices are batteries (Fig. 2 as applied to claim 3).

The difference between claim 1 and Jung is that Jung does not expressly disclose the controller being employed to control the fuel supplied to the fuel cell stack.

Jung teaches of the desire to control the voltage output of the fuel cell (Fig. 3). Jung additionally teaches of connecting the controller 119 to the fuel cell stack. one of ordinary skill in the art would have found regulation of the reactants (fuel and oxidant) to the fuel cell to have been an obvious parameter to control the voltage output of the fuel cell stack.

Ueda discloses a fuel cell power plant including a fuel cell stack in combination with an electric energy storage device. The controller of Ueda regulates the flow of fuel supplied to the fuel cell stack (Fig. 3).

The motivation for connecting the controller of Jung to regulate the fuel flow to the fuel cell stack as shown by Ueda is that it provides an accurate way for determining the required output of the fuel cell stack and supplying the requisite amount of reactants or fuel to the stack to achieve the desired power output for the load.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Jung by connecting the controller to regulate the fuel flow since it would have provided an accurate way for determining the required output of the fuel cell stack and supplying the requisite amount of reactants or fuel to the stack to achieve the desired power output for the load.

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7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jung in view of Ueda as applied to claim 1 above, and further in view of U.S. patent No. 6,484,830 (Gruenwald).

The difference not yet discussed is of the storage device being at least one supercapacitor.

The use of batteries and capacitors as electric energy storage devices in a hybrid fuel cell power plant is well known in the art. Batteries and capacitors provide an equivalent energy storage means in the system which can provide back-up power as needed.

According to Gruenwald, capacitors provide significant advantages over batteries since batteries exhibit hysteresis in their voltage, current, and state of charge relationships. Batteries also must be current limited and/or cell voltage limited. Near full charge, lead acid batteries cannot accept high currents without plate damage. Capacitors accept very high currents. Capacitors also approach their voltage limits more slowly and do not experience damage while accepting currents just below their maximum charge. The ultracapacitor (i.e., supercapacitor) bank also allows for the exceptional recapture of energy that would otherwise be lost during braking (paragraph bridging columns 5 and 6).

The motivation for using supercapacitors over batteries is that they can accept higher currents, are more resistant to damage when accepting the current just below their maximum charge and allow for exception recapture of mechanical energies generated in the apparatus using the hybrid power plant.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Jung by replacing the batteries with supercapacitors as taught by Gruenwald since it would have provided an electric energy storage device which could accept higher currents, be more resistant to damage when accepting the current just below their maximum charge and allowed for exceptional recapture of mechanical energies in the system.

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2004/0018399 (Jung) in view of U.S. patent No. 6,847,127 (Lee).

Jung discloses a fuel cell power plan in Fig. 2 comprising a fuel cell stack 103 having electric power output lines, an electric storage element 101 associated with the stack, DC/DC converter 111 which is a means for providing a voltage to element 101 which is a fraction or multiple of the voltage between the output power lines. Controller 119 is a means for controlling the voltage provided to element 101 (Figs .1 and 2 as applied to claim 5).

The differences between claim 5 is that Jung does not teach of the method steps of providing a voltage which is always either a multiple of fraction of the voltage between the output lines.

Jung teaches of a method of providing electrical energy to the battery 101 through a DC/DC converter.

The power system for a conventional fuel cell hybrid electric vehicle includes a fuel cell used as the main power source and a battery used as the auxiliary power

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source. A bi-directional DC/DC converter connected in parallel between the fuel cell and the battery, which supplies a stable voltage to a motor. This maintains a balance between different output voltages of the fuel cell and the battery and supplies a surplus voltage of the fuel cell and the regeneration energy as a charge voltage of the battery. An inverter connected to an output terminal of the bi-directional DC/DC converter and an output terminal of the fuel cell. The inverter also controls the operation of the motor by IGBT switching effected through PWM (pulse width modulation) control (Lee, col. 1, ll. 50-62).

Response to Arguments

9. Applicant's arguments with respect to claim 1-3 and 5 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

10. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: none of the prior art of record appears to teach, fairly suggest or render obvious the invention of claim 6. In particular: the method therein where the controlling step comprises increasing or decreasing the voltage provided to the electric energy storage device above or below said multiple or said fraction to increase response of said electric energy storage device to load transients.

Jung teaches of providing a DC/DC converter which is capable of performing this

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function. However, in terms of the actual method itself, Jung does not provide sufficient teachings or suggestion to perform the process as defined in claim 6.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. patent No. 5,777,454 (McAndrews) discloses a power supply system comprising a primary DC power source 8, electric power output lines 12 connected to both a power conditioning system feeding a load 10 and to the load 10 itself. A controller 26 regulates the power supply. Electrical storage device 14/16 is connected between the power lines and is connected to DC converter PS1 and are connected in series with one another across the output lines of the primary DC power source 9 (Ione Figure).

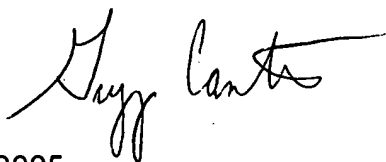
12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (571) 272-1283. The examiner can normally be reached on Monday to Thursday from 9 a.m. to 6 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. FAXES received after 4 p.m. will not be processed until the following business day. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For

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more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gregg Cantelmo
Primary Examiner
Art Unit 1745

gc

A handwritten signature in cursive script, appearing to read "Gregg Cantelmo".

May 5, 2005

**GREGG CANTELMO
PRIMARY EXAMINER**